

# Weather Synopsis –February 2020.

Weak northeast monsoon conditions prevailed throughout the month. Significantly below normal rainfalls were received over most parts of the island (Figs 1 and 2). Large-scale subsidence was evident over Sri Lanka region (Fig 7). Most of meteorological stations as well as hydro catchment areas reported exceptionally below normal rainfalls (Fig 2). But the much expected seasonal cold weather was not eminent during the month. Mean maximum and mean minimum temperatures were 1.0 -2.5<sup>0</sup>C above average over most parts of the island for February (Figs 11 and 12).

According to Disaster Management centre, strong winds were reported from Haldumulla on 14<sup>th</sup> February 2020.

Warm ENSO neutral conditions and neutral IOD conditions were observed during Month of February 2020. However, sea surface waters in tropical Indian Ocean and in the tropical Pacific near to and west of the Date Line are warmer than average (Fig. 4 )

The Madden-Julian Oscillation (MJO) was weak over Indian Ocean during 1<sup>st</sup> week and propagated eastward to the phase 4 Maritime Continent 06<sup>th</sup> and then to phase 5 to 7 the western and central Pacific Ocean from 11<sup>th</sup> to 24<sup>th</sup> (Fig 5).

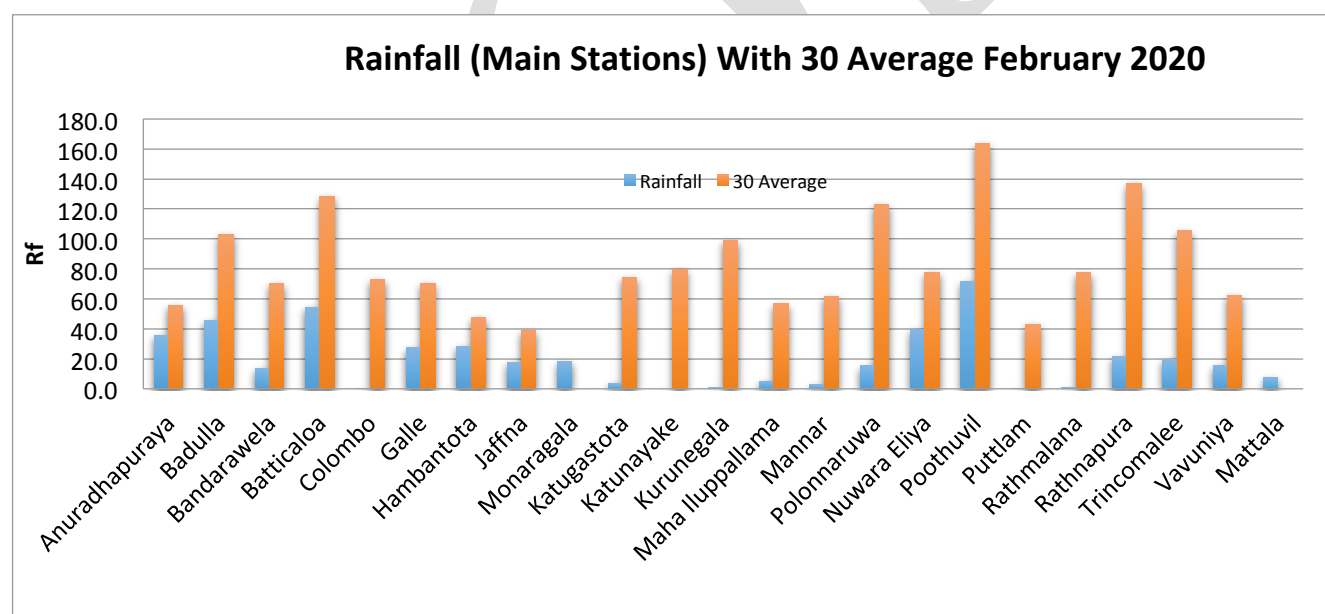


Fig 1 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during February 2020

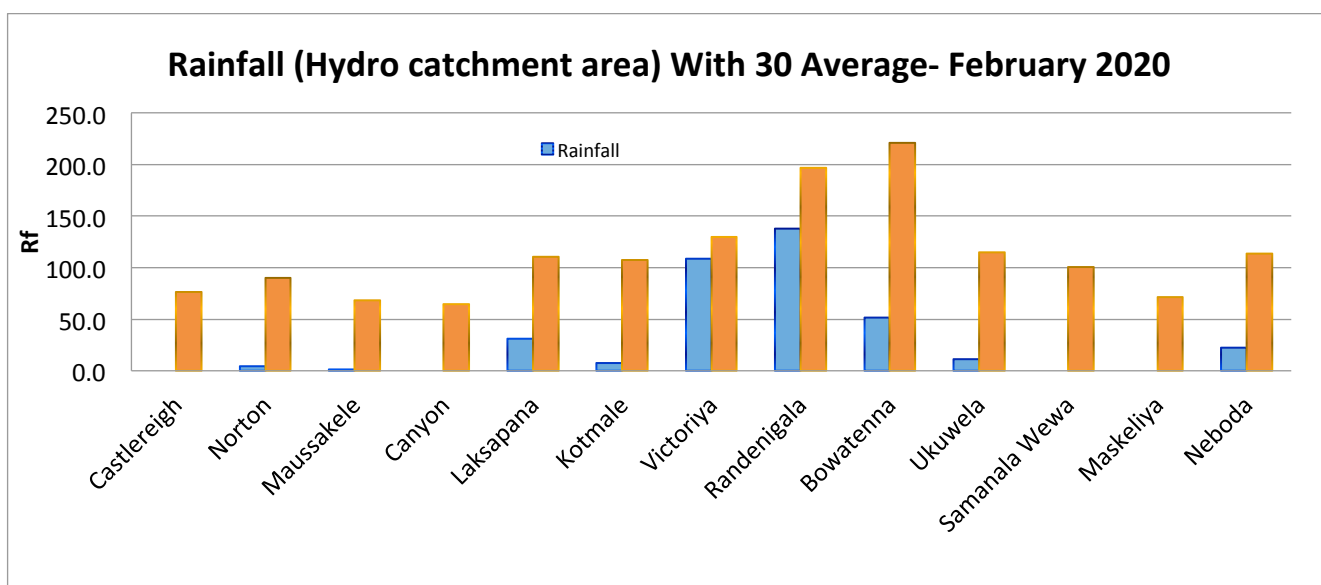


Fig 2 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at at **Hydro catchment areas** during February 2020

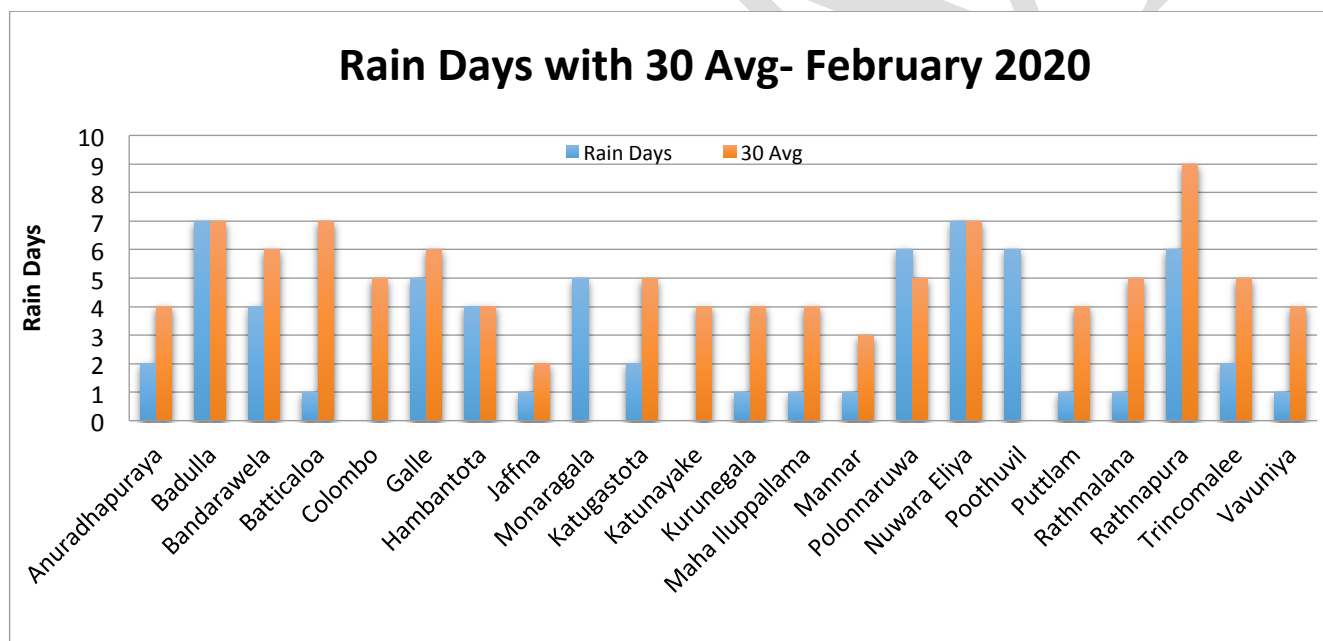


Fig 3 monthly total no of rainy days with 30 years (1961-1990) of their averages at main Meteorological stations during

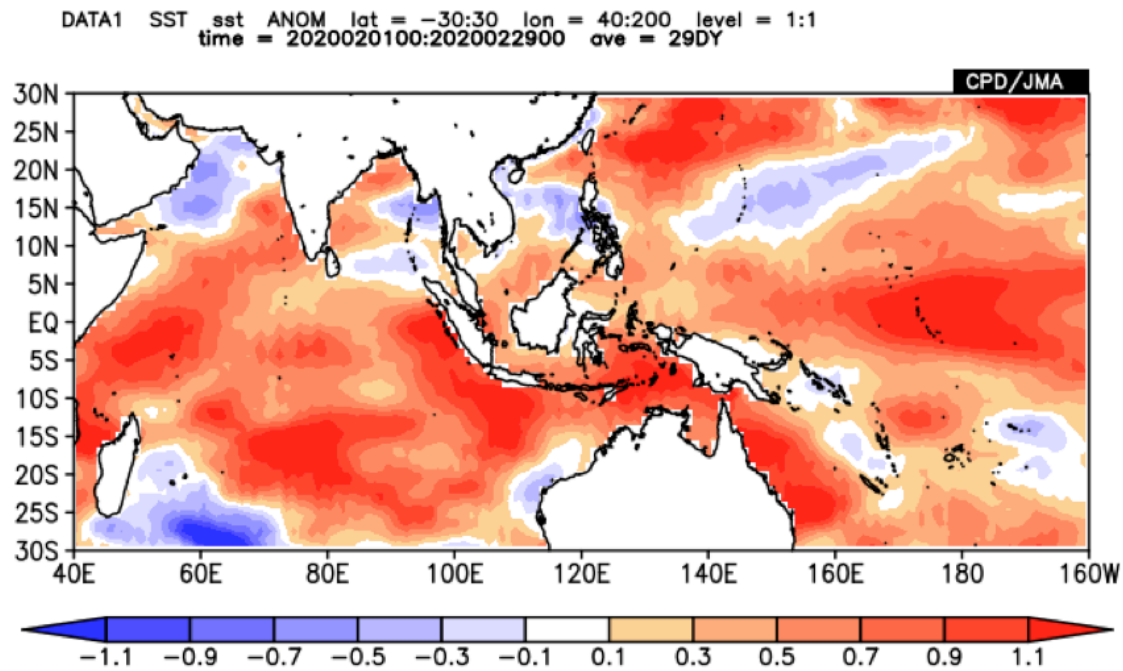
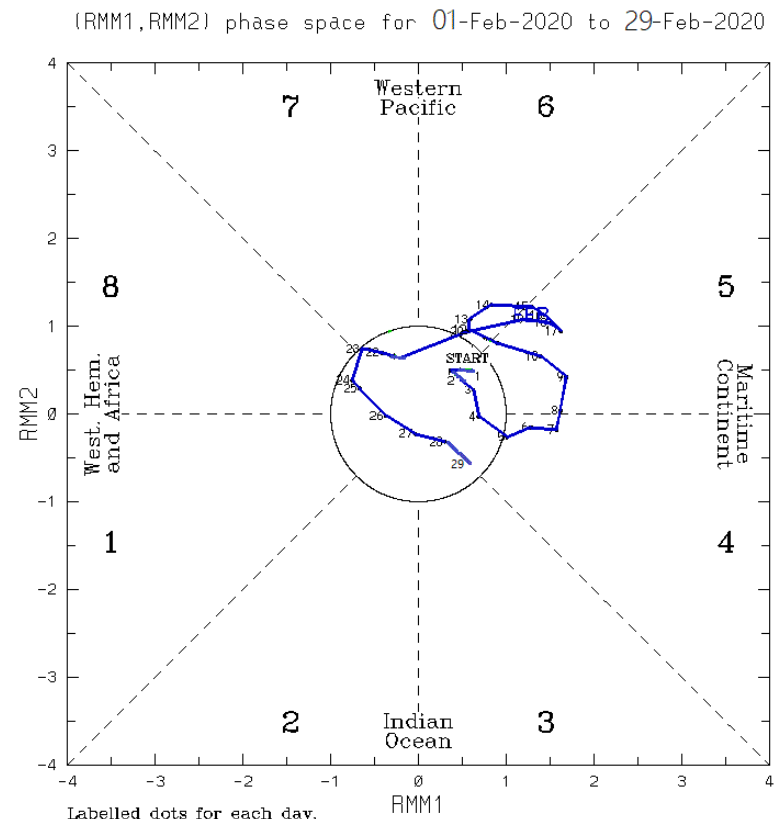


Fig 4 : Sea Surface Temperature anomaly for February 2020



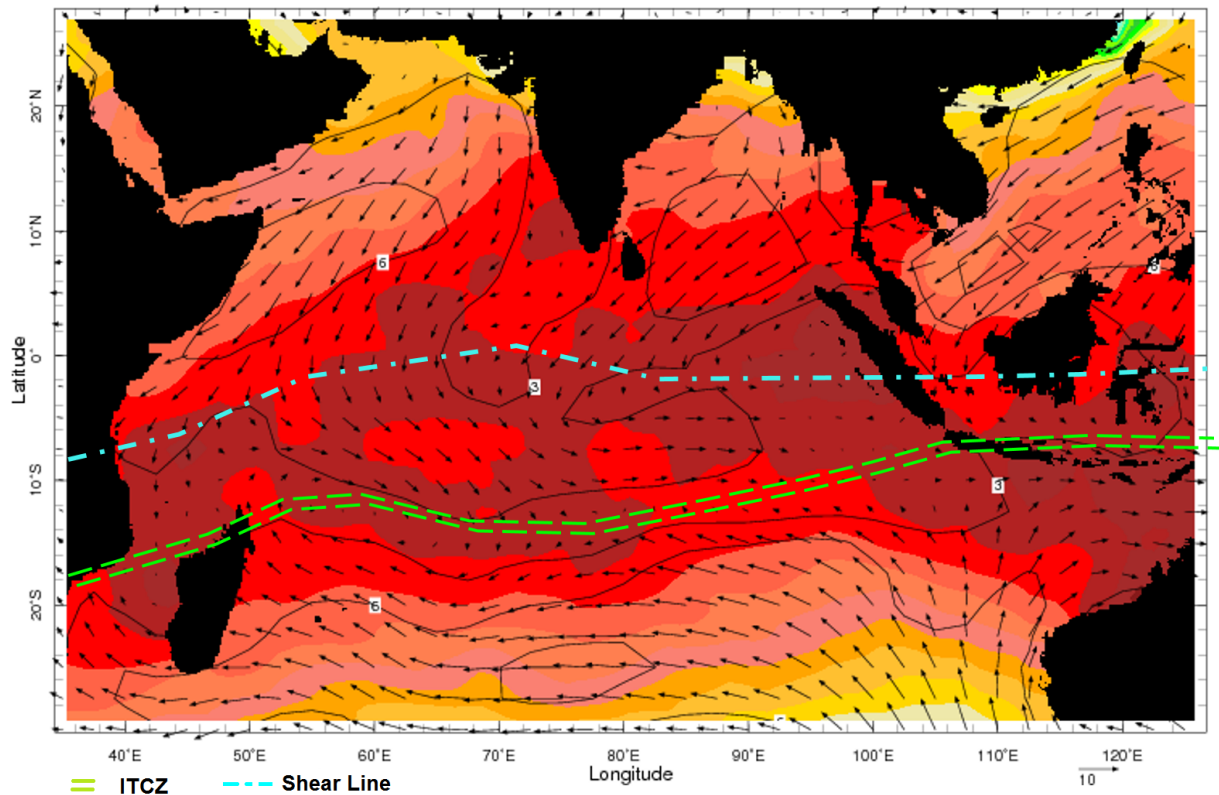
Labelled dots for each day.

Blue line is for Feb, green line is for Jan, red line is for Dec.

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2020

Fig 5 MJO phase diagram

Ocean Surface winds and Ocean Surface Temperature for February 2020



**Fig 6:** Ocean Surface Winds and Ocean Surface Temperature for February 2020.

During the month, the Inter Tropical Convergence Zone lay between  $18^{\circ}\text{S}$ ,  $40^{\circ}\text{E}$  and  $12^{\circ}\text{S}$ ,  $60^{\circ}\text{E}$ ,  $14^{\circ}\text{S}$ ,  $75^{\circ}\text{E}$  and  $10^{\circ}\text{S}$ ,  $110^{\circ}\text{E}$  while the shear line was around  $08^{\circ}\text{S}$ ,  $40^{\circ}\text{E}$ ,  $02^{\circ}\text{S}$ ,  $60^{\circ}\text{E}$ ,  $02^{\circ}\text{S}$ ,  $80^{\circ}\text{E}$ , and  $02^{\circ}\text{S}$ ,  $120^{\circ}\text{E}$  (Fig 6). ITCZ fluctuated about  $02^{\circ}$  from the average position during the month.

### Weather systems

**In the south Indian ocean** there were two tropical disturbances. The low-pressure area that had once been Tropical Cyclone Francisco has been lingering in the Southern Indian Ocean since February 5. It was originated 1200 km east-southeast of Mauritius and moved to the south eastward before weakened below tropical cyclone status. Since then, Francisco's remnants moved into an area of warm waters and low wind shear allowing the low-pressure area to re-organize. Francisco re-formed near latitude  $19.0$  degrees south and longitude  $49.3$  east, approximately 200 km east of Madagascar on 13th. Francisco has tracked west - southwestward and made landfall on the eastern coast of Madagascar on 15th.

Tropical cyclone GABEKILE was formed on Feb. 15 about 1800 km east-north-east of Mauritius. It moved southward and dissipated on 18<sup>th</sup> in the South Indian Ocean.

### East West Vertical cross section of pressure vertical velocity across Sri Lanka February 2020

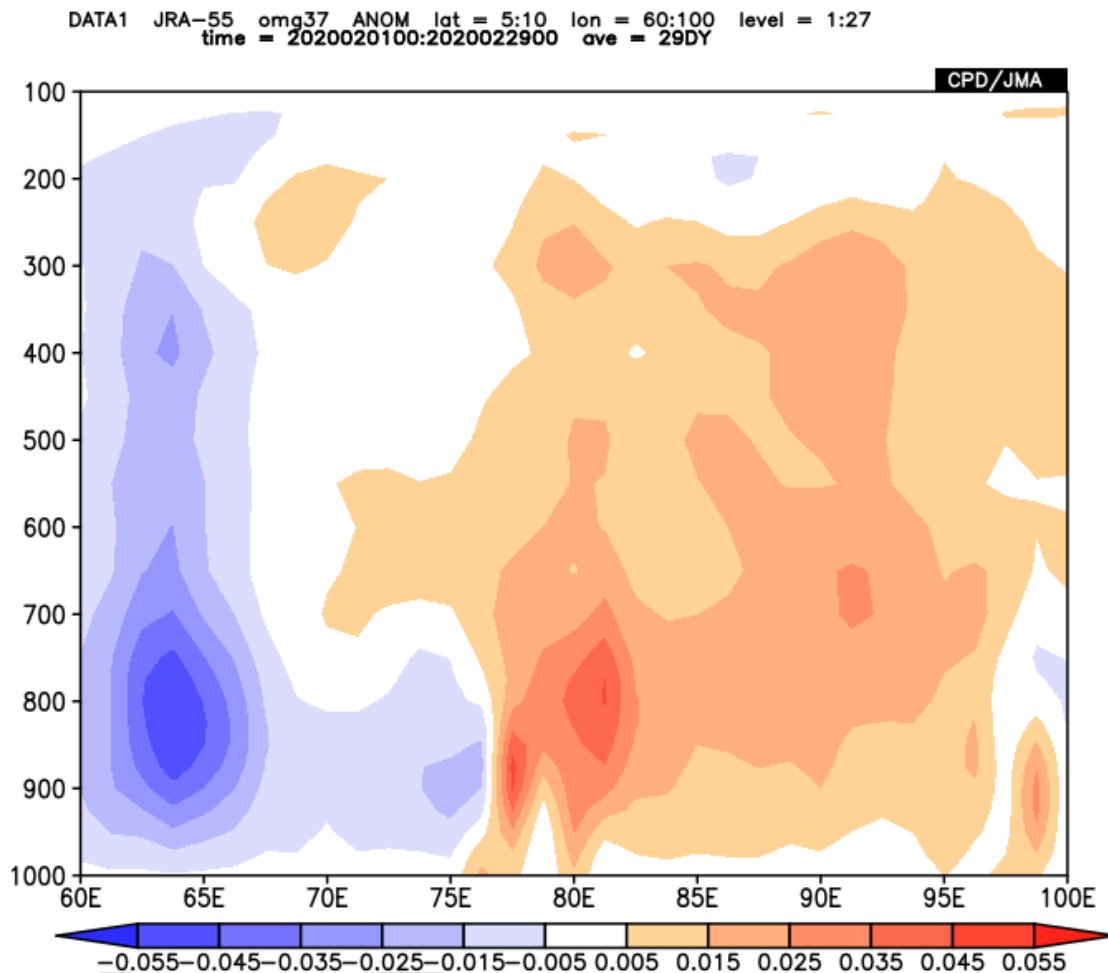


Fig 7 : Vertical cross-section of Pressure vertical wind anomaly for February 2020 (JRA55).

**Pressure and wind field:** Over the island, pressure values were above or about average except for a few days such as 1<sup>st</sup> to 2<sup>nd</sup> February and 25<sup>th</sup> to 29<sup>th</sup> February when below average pressure values observed. On 11<sup>th</sup>, 13<sup>th</sup>, 17<sup>th</sup>, 19<sup>th</sup>, 22<sup>nd</sup>, 23<sup>rd</sup>, 24<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> there was a mild Northeasterly gradient while in the other days the distribution was either even or fairly even. Surface wind over the island was predominantly Northeasterly in direction with speed of 05-10 knots. Calm variable winds were reported on 2<sup>nd</sup> and from 06<sup>th</sup> to 09<sup>th</sup> February 2020.

#### Upper winds:

**At 850hPa,** North-easterly wind flow was dominated over the island. Averaged ridge axis was positioned from 20°N40°E, 25°N70°E, 18°N100°E and 24°N120°E.

**At 700 hPa,** North-easterly wind flow originated from anticyclonic circulation centred at Maharashtra India, was dominated over the island. Averaged ridge axis was positioned from 15°N40°E, 18°N55°E,



15°N65°E, 18°N75°E, 15°N85°E, and 18°N120°E. Anomalous anticyclone appeared southeast of Sri Lanka may have played a role in below normal monthly rainfall for February 2020 .

**At 500 hPa**, easterly wind flow dominated during the month. Averaged ridge axis was positioned closer to north of Sri Lanka from 14°N40°E, 12°N75°E, 12°N85°E, and 14°N120°E.

**The 200 hpa** the upper tropospheric ridge was laid around 09°N bringing predominantly southeasterly to southerly winds across Sri Lanka.

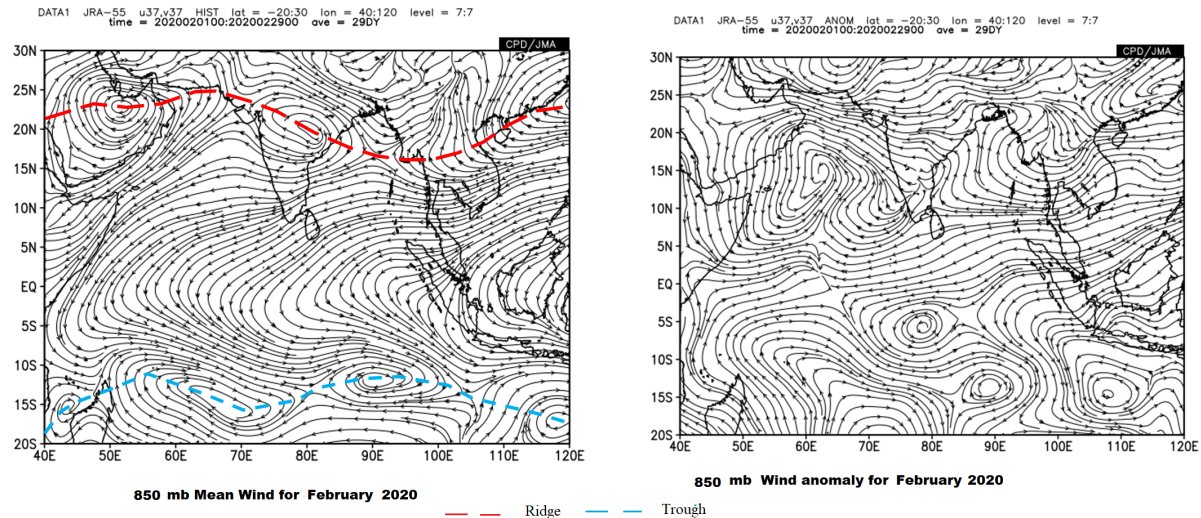


Fig 8 Monthly average wind pattern at 850hpa level during the month of February 2020 (JRA55)

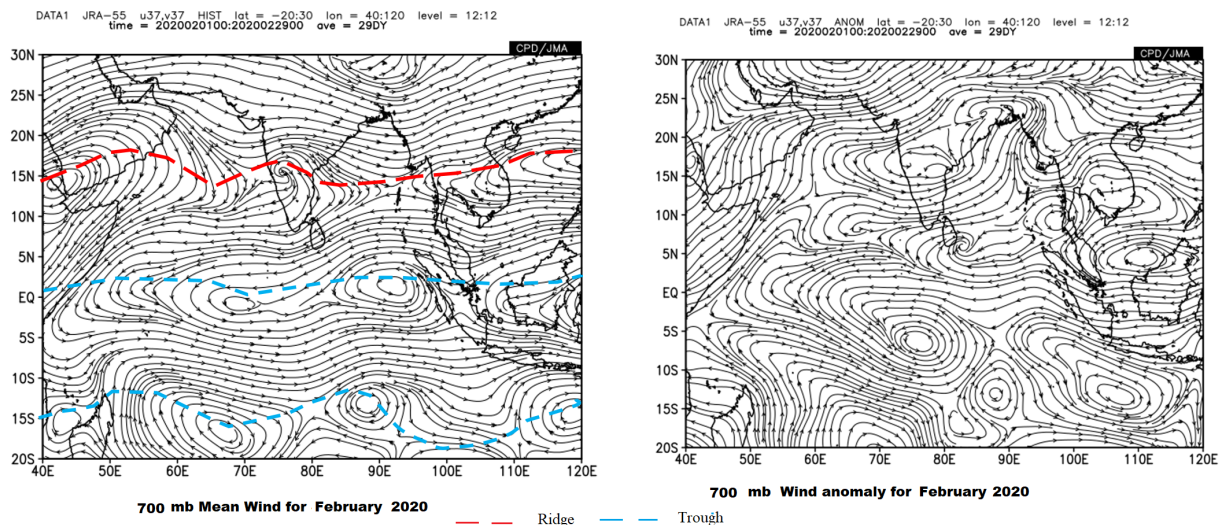


Fig 9 Monthly average wind pattern at 700hpa level during the month of February 2020 (JRA55)

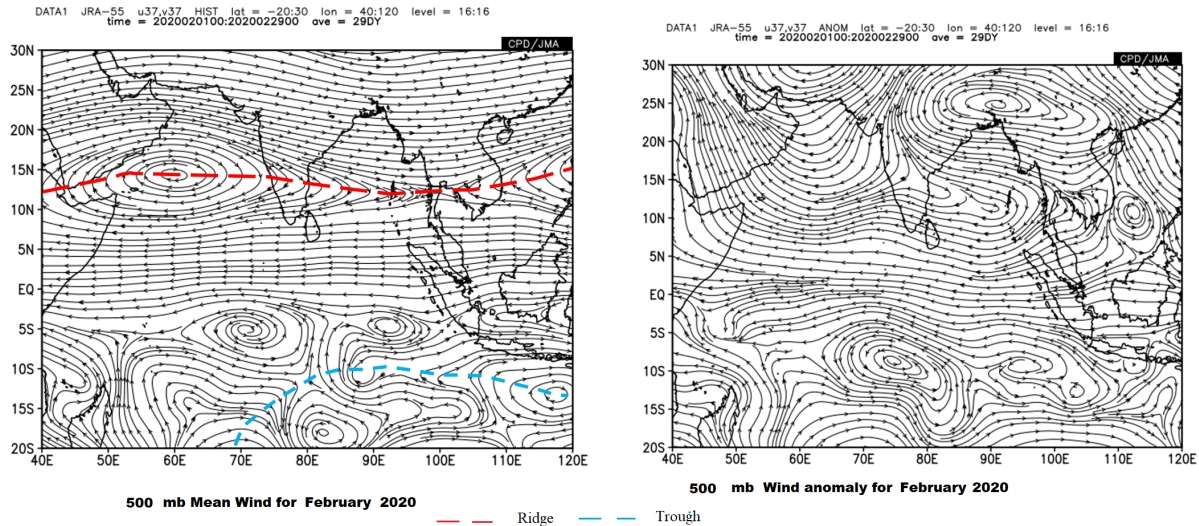


Fig 10 Monthly average wind pattern at 500 hpa level during the month of February 2020 (JRA55)

### Temperature Field:

The maximum temperatures in the day were mostly 1-3<sup>0</sup>C above normal at most places during the month. It was below normal over some stations during 12-13<sup>th</sup> and 21<sup>st</sup> to 23<sup>rd</sup>. Highest recorded maximum temperature for the month of February 2020 was 37.1<sup>0</sup>C from Ratnapura on 28<sup>th</sup>.

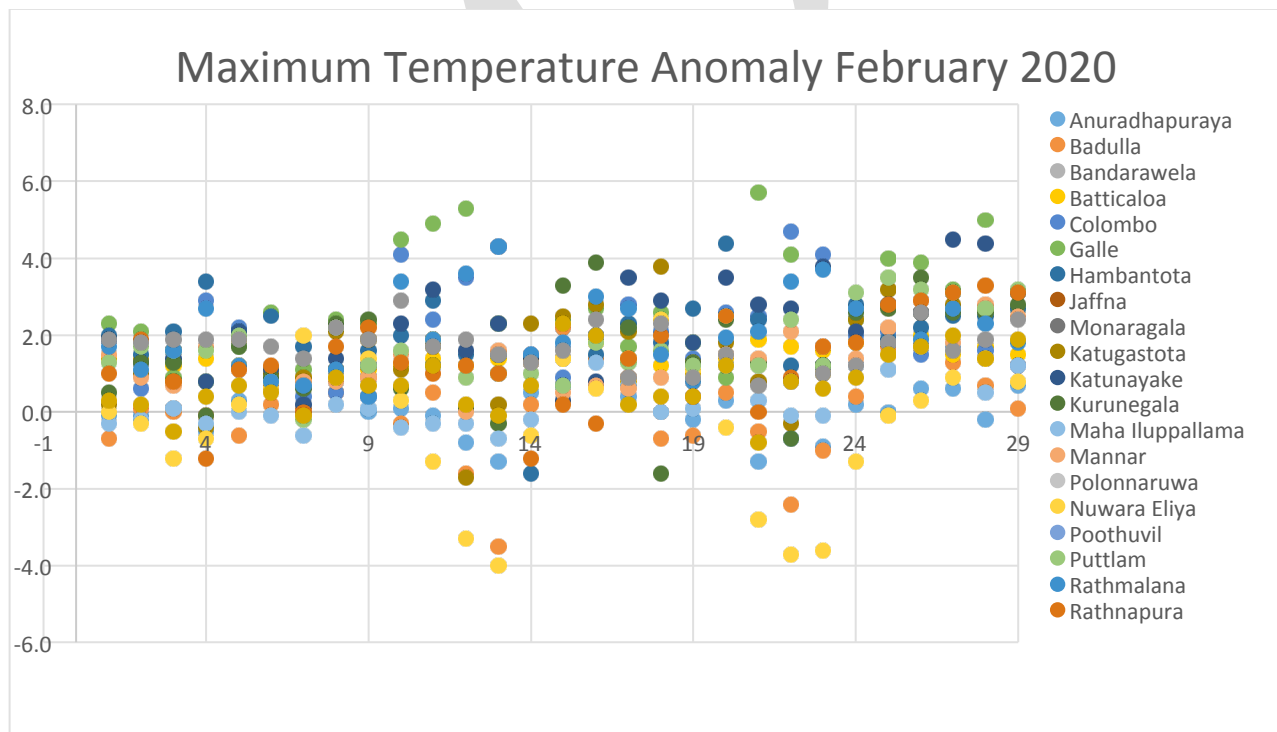


Fig 11 Maximum Temperature anomaly (<sup>0</sup>C) for February 2020

**Night minimum temperatures** over most parts were about or 1-2<sup>0</sup>C above normal during the month. below normal night temperature were reported from several station on 1<sup>st</sup> , 10<sup>th</sup> and 18<sup>th</sup> and 19<sup>th</sup>. Lowest recorded minimum temperature for the month of February 2020 was 4.8<sup>0</sup>C from NuwaraEliya on 18<sup>th</sup>.

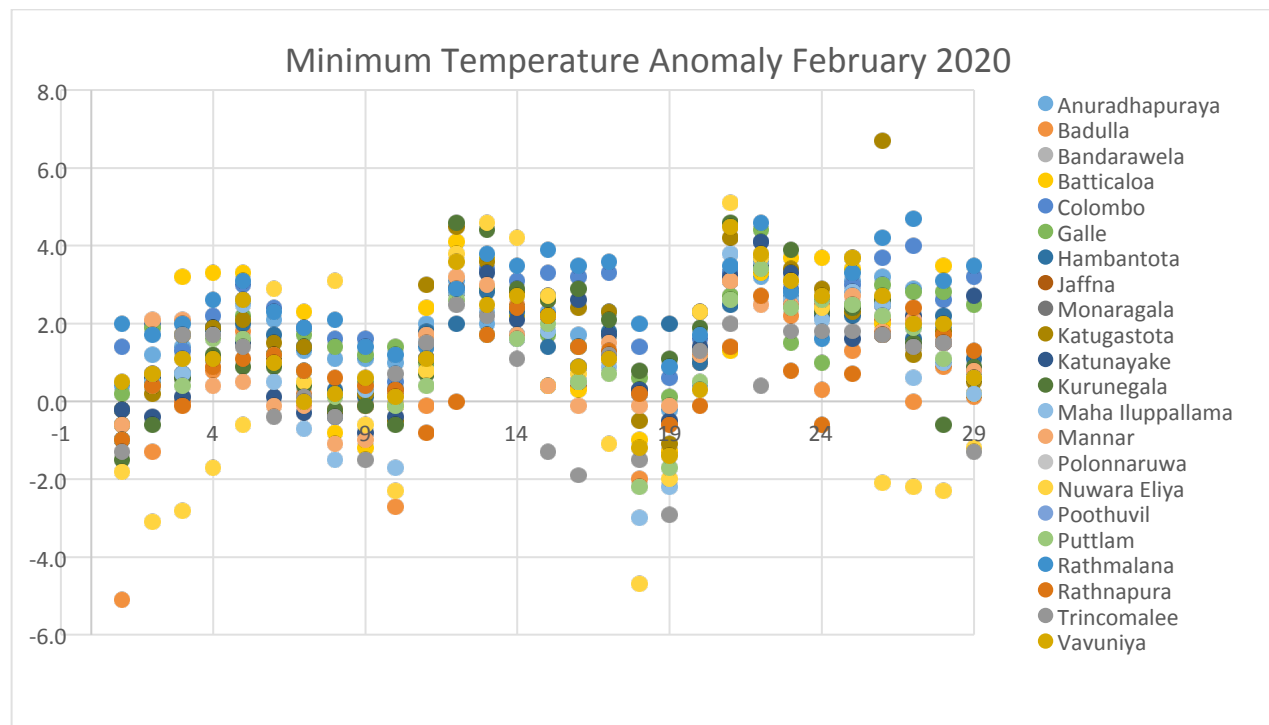


Fig 12 Minimum Temperature anomaly (<sup>0</sup>C) for February 2020

Maximum and Minimum departures from normal day/night temperature were shown in table 1.

**Rainfall:** Significantly below normal rainfalls were received over most parts of the island (Fig 1). Highest rainfall received during 24hours was 150mm rainfall from Hope followed by 106mm rainfall from Illukkuchchanai on 22<sup>nd</sup> February. Highest cumulative rainfall was 351 mm at Hope.

Afternoon thundershowers were reported over southwestern parts on 05<sup>th</sup> with 60mm rainfall from Karagala. Convective showers were reported from central and south-eastern parts on 12<sup>th</sup> with 99mm, 74.1mm and 56.2 mm rainfall from Hope, Kurunduoya and Lookkandura respectively. Convective activity again enhanced from 20<sup>th</sup> to 22<sup>nd</sup>. Fairly heavy falls were reported on 20<sup>th</sup> such as 87.9mm, 53.7mm and 50mm rainfall from Nawakiriuru Tank, Batticaloa, and Pannalgama respectively. There were significant widespread thundershowers were reported over Nothcentral, North-eastern, central and eastern parts on 21st February 2020. 75mm, 68mm, 56mm, 55mm rainfall were reported from Mabadowa, Palampoddar, Hope, Kurunduoya and Sri Lanka Navy base Trincomalee respectively on 21<sup>st</sup>.

The table 2 and the figures 1 and 2 shows the total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective averages. The rainfall during the month was well below average at all stations. It is worthy to mention that stations located along western coast such as Colombo, Ratmalana and Katunayake received less than 1% of monthly average.



Number of rain days was also reported below average except Badulla, Hambantota, Polonnaruwa and NuwaraEliya. In the case of rainfalls in Hydro catchment areas, well below average rainfalls were reported from all catchment areas.

Table 1(a) - Extremes of Maximum Temperatures February 2020				
	Maximum			Highest Std.Div
	Value	Offsets		
		(-)	(+)	
Value	37.1	4	5.7	1.91
Station	Ratnapura	NuwaraEliya	Galle	Mattala
Date	28/02/2020	13/02/2020	21/02/2020	
Table 1(b) -Extremes of Minimum Temperature February 2020				
	Minimum			Highest Std.Div
	Value	Offsets		
		(-)	(+)	
Value	4.8	5.1	6.7	2.8
Station	NuwaraEliya	Badulla	Kurugeala	NuwaraEliya
Date	18/02/2020	01/02/2020	26/02/2020	

Meteorological station	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
	2020-Feb	Average	%	2020-Feb	Average	%
Anuradhapuraya	35.6	55.4	64.3%	2	4	50.0%
Badulla	45.5	103.1	44.1%	7	7	100.0%
Bandarawela	13.8	70.2	19.7%	4	6	66.7%
Batticaloa	54.2	128.4	42.2%	1	7	14.3%
Colombo	0.1	72.7	0.1%	0	5	0.0%
Galle	27.4	70.5	38.9%	5	6	83.3%
Hambantota	28.1	47.6	59.0%	4	4	100.0%
Jaffna	17.6	39.0	45.1%	1	2	50.0%
Monaragala	18.1			5		#DIV/0!
Katugastota	3.8	74.2	5.1%	2	5	40.0%
Katunayake	0.0	79.8	0.0%	0	4	0.0%
Kurunegala	0.6	98.8	0.6%	1	4	25.0%
Mahalluppallama	5.2	56.8	9.2%	1	4	25.0%
Mannar	2.7	61.8	4.4%	1	3	33.3%

Polonnaruwa	15.3	123.2	12.5%	6	5	120.0%
NuwaraEliya	39.6	77.7	51.0%	7	7	100.0%
Poothuvil	71.5	163.6	43.7%	6	na	#VALUE!
Puttlam	0.4	43.1	0.9%	1	4	25.0%
Rathmalana	1.0	77.3	1.3%	1	5	20.0%
Rathnapura	21.4	137.0	15.6%	6	9	66.7%
Trincomalee	19.4	105.4	18.4%	2	5	40.0%
<b>Vavuniya</b>	15.6	62.5	25.0%	1	4	25.0%
Mattala	7.4			3		#DIV/0!

Table-02-Monthly Total Rainfall(mm) and monthly total no of rainy days with 30 years(1961-1990) of their averages at main Meteorological stations during February2020

*Note that the meteorological day in this text is reckoned as the 24hr period from 08.30hrs to 08.30hrs following day*

Hydro Catchment	February 2020	Average	% (percentage of average)
Castlereigh	0.0	76.6	0.0%
Norton	4.4	90.4	4.9%
Maussakele	1.0	68.1	1.5%
Canyon	0.0	64.4	0.0%
Laksapana	30.8	110.4	27.9%
Kotmale	7.7	107.3	7.2%
Victoriya	108.9	129.7	84.0%
Randenigala	137.8	196.9	70.0%
Bowatenna	51.9	220.9	23.5%
Ukuwela	11.2	114.9	9.7%
SamanalaWewa	0.0	100.5	0.0%

Table-03-Monthly Total Rainfall(mm) with 30 years(1961-1990) of their averages at Hydro catchment areas during February2020

Prepared by National Meteorological Centre(NMC)  
Department of Meteorology